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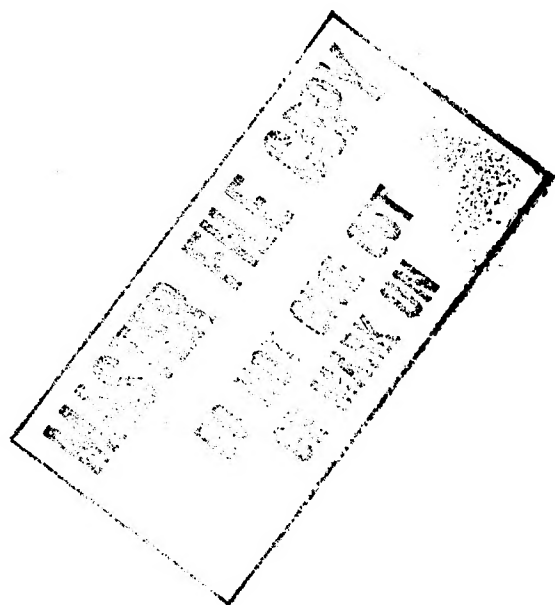
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# Indonesia: Foreign Investment in the Oil Sector

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An Intelligence Assessment



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EA 84-10113  
June 1984

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# Indonesia: Foreign Investment in the Oil Sector

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**An Intelligence Assessment**

This paper was prepared by [ ] Office of  
East Asian Analysis. Comments and queries are  
welcome and may be addressed to the Chief,  
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**Indonesia: Foreign  
Investment in the  
Oil Sector**

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**Key Judgments***Information available  
as of 16 June 1984  
was used in this report.*

Jakarta's favorable financial terms for foreign oil companies and its foresight in obtaining long-term exploration commitments in the 50 production-sharing contracts signed since 1978 have paid off in high levels of exploration by foreign oil companies during the past two years. Signs of a slowdown in exploration for oil, however, are becoming increasingly evident as the soft oil market persists. [ ]

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The government recognizes its dependence on foreign oil companies for capital and technology in oil and gas production and its need for foreign assistance in developing alternate energy resources. Although Jakarta hopes to end this dependence, we believe the government will encourage foreign investors in the energy sector at least through the 1980s. [ ]

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On the negative side, Jakarta's efforts to boost Indonesian participation in the oil industry and former Pertamina President Sumbono's hardline approach toward the US firms, Caltex and Stanvac, could cause problems. The ouster of Sumbono should ease oil company fears, but Jakarta will have to be careful to avoid damaging investor confidence. [ ]

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Partly financed by Japanese Government funds, Japanese firms are helping to cushion Indonesia from the global oil exploration slump because of Tokyo's concern with ensuring the security of its oil imports. The Japanese seem likely to maintain the level of their activity in the coming years even if the oil market fails to recover, but they are unlikely to challenge US dominance in the industry. [ ]

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Further growth in investment in the oil industry will depend mainly on the world oil market, although any misstep by Jakarta could further discourage exploration. As for alternative energy resources, investment gains will probably be modest, although Jakarta will continue to seek new markets for its extensive natural gas resources. [ ]

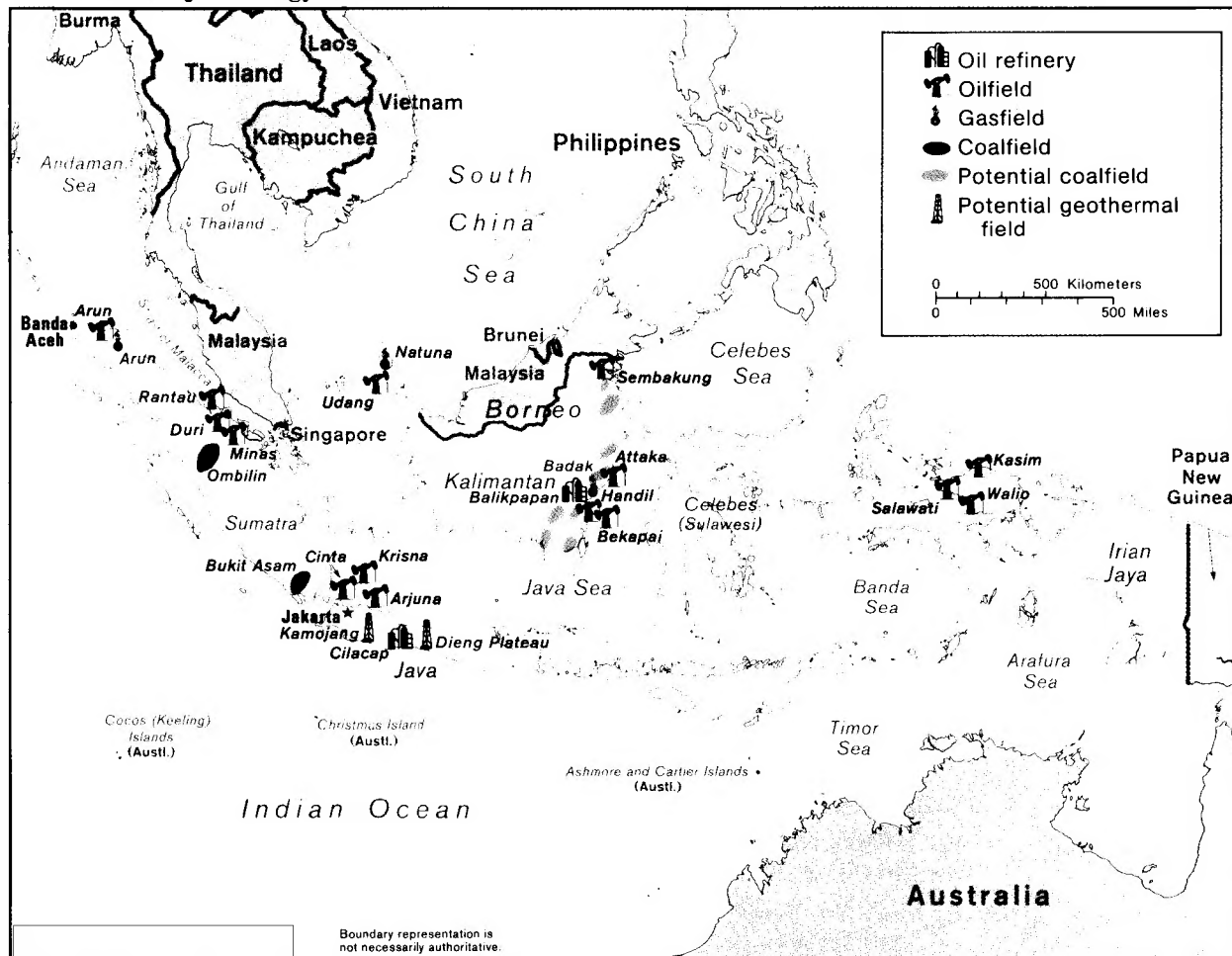
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**Figure 1**  
**Indonesia: Major Energy Resources**



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## Indonesia: Foreign Investment in the Oil Sector

### Developments in the Oil Industry

In the past two years, the soft world oil market has forced OPEC countries to cut both production and prices of their crude oil and has caused worldwide oil exploration to tumble. Although foreign oil companies in Indonesia have maintained active exploration programs to satisfy commitments made before the oil glut, a slowdown in exploration is becoming increasingly evident as the soft market persists and Jakarta finds fewer companies willing to sign new production-sharing contracts. Intensive exploration is necessary just to restore the reserves depleted each year, and a slowdown raises questions about Indonesia's long-term production capacity. Because Jakarta's ability to develop alternate energy resources also will probably remain limited (see appendix), growth prospects for the economy as a whole would be weakened.

### Recent Developments

Indonesian oil output, which peaked at nearly 1.7 million barrels per day in 1977, slipped in the following two years before recovering to its long-term sustainable capacity of about 1.6 million b/d in 1981. In March 1982, however, Indonesia's production ceiling was set at 1.3 million b/d in accord with OPEC production quotas aimed at averting a downward price spiral. Output remained at that level even after the persistent soft market forced OPEC to cut crude oil prices by \$5 a barrel in March 1983 (see table 1). Since mid-1983 Jakarta has gradually relaxed the constraints on oil companies, allowing crude oil output to rise above its OPEC quota to nearly 1.5 million b/d by yearend. Even so, oil export earnings, which rose from \$7 billion in 1978 to \$16 billion in 1981, fell to \$11 billion in 1983.

Despite reduced earnings, the oil sector has continued to attract considerable foreign capital as the momentum of the 1979-80 oil price boom and Indonesia's financially attractive production-sharing terms have kept oil exploration and development high. According to the US Embassy, foreign oil companies in 1983 boosted spending on exploration nearly 10 percent to \$1.2 billion. After completing 238 exploratory wells

**Table 1**  
**Oil Output, 1982 and**  
**January-June, 1983**

Barrels per day

Company	1982	1983
All companies	1,337,504	1,304,654
Arco	128,226	107,192
Asamera	8,769	4,673
Associated Australia	569	
Caltex	558,445	583,633
Conoco	24,682	19,010
Huffco	25,154	21,592
IIAPCO	110,845	102,700
Lemigas	535	697
Mobil	75,937	75,562
Pertamina	75,003	94,079
Petromer Trend	43,351	39,472
Phillips	3,406	3,065
Stanvac	36,203	34,666
Tesoro	6,756	6,549
Total/Inpex	164,178	154,650
Union/Inpex	75,445	57,114

out of 284 budgeted in 1982, companies completed about 260 exploratory wells out of 323 planned in 1983. Seismic activity in 1983 approached the previous year's level. In addition, Tokyo's efforts to assure secure supplies of oil imports by financing Japanese oil company operations are helping to cushion exploration in Indonesia against a reduction.

Jakarta continues to benefit from its foresight in obtaining long-term exploration commitments in the 50 production-sharing contracts signed since 1978. Since the exploration boom began in 1978, Jakarta has obtained commitments from its contractors to conduct active exploratory drilling for at least the first four to six years of their contracts. Notwithstanding

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**Table 2**  
**Indonesia: Production-Sharing Contracts, 1982-83**

Company (Country)	Block	Exploration Commitment	Location	Area (sq. km.)
<b>1982</b>				
Tesoro (United States)	Tarakan, East Kalimantan	\$8 million (six years)	Onshore	240
Elf Aquitaine (France)	Ritan, Central Kalimantan	\$49.3 million (10 years)	Onshore	18,260
Elf Aquitaine (France)	Maruwai, Central Kalimantan	\$55.5 million (10 years)	Onshore	19,535
Union Texas (United States)	Cilacap, Central Java	\$31.5 million (six years)	Offshore	13,640
LL&E/Getty (United States)	Pelabuhan Ratu, West Java	\$34 million (six years)	Offshore	9,275
Mobil (United States)	Semayang, East Kalimantan	\$149 million (six years)	Onshore	18,640
Amoco (United States)	Lombok, West Nusa Tenggara	\$68.8 million (six years)	Offshore	26,640
Jackson Kutei Basin (United States)	Adang, East Kalimantan	\$40 million (six years)	Onshore	10,140
Inpex (Japan)	Banda Aceh, Sumatra	\$88 million (six years)	Offshore	29,905
Sceptre Resources (Canada)	Block A, West Java Sea	\$50 million (six years)	Offshore	13,320
Sceptre Resources (Canada)	Block B, West Java Sea	\$47 million (six years)	Offshore	17,740
Hudbay, Pennzoil, and Husky (Canada). One-third each.	Northeast Java	\$47.85 million (six years)	Onshore and off-shore	13,970
Promet (Malaysia)	Southwest Arafura, Irian Jaya	\$55 million (six years)	Onshore and off-shore	18,315
<b>1983</b>				
Total (France)	West Melawi, West Kalimantan	\$48.5 million (eight years)	Onshore	13,295
Elf Aquitaine (France)	East Melawi, West Kalimantan	\$25 million (six years)	Onshore	8,920
Asamera (Canada)	Corridor Block, South Sumatra	\$60 million (six years)	Onshore	11,152

the current high level of investment in the oil sector, however, the international oil glut is beginning to threaten exploration and thus earnings prospects of the mainstay of Indonesia's economy:

- [ ] companies were drilling the minimum number of wells required by their contracts last year and are slowing exploration further in 1984.

- Companies signed only three new production-sharing contracts <sup>1</sup> in 1983, compared with 13 in 1982, raising doubts about Jakarta's ability to sustain its long-term production capacity (see table 2).

<sup>1</sup> Since the mid-1960s all new contracts have been production-sharing agreements under which Pertamina exercises management authority and obtains a share of each contractor's crude oil output. Under the older concession-type contracts, the foreign oil companies exercised decisionmaking authority within their concession areas and remitted a share of their profits to Jakarta, a practice that made Jakarta suspicious of oil company accounting methods.

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**The Energy Bureaucracy**

*To make energy planning more effective, Jakarta established a 12-member National Energy Planning Board (Bakoren) in 1980 under the chairmanship of the Minister of Mining and Energy. The group, which includes representatives of key industry, energy, and economic planning ministries, as well as the military, has become the primary forum for debating national energy policy.* [redacted]

*The Ministry of Mining and Energy consists of three directorates responsible for petroleum and natural gas, mining and geothermal energy, and electric power development. Besides overseeing Pertamina (the state oil company), P. T. Tambang Batubara (the state coal mining company), and PLN (the state electric power company), the directorates supervise all private firms operating within their areas of responsibility.* [redacted]

*Pertamina is the centerpiece of Indonesia's energy policy making because of the dominance of oil and gas in the economy. The company is Indonesia's largest employer, with more than 47,000 employees,*

*and is responsible for supervising all production sharing companies and over 200 oil service firms. Pertamina is headed by President Director Abdul Rachman Ramly and six other directors, all appointed by President Soeharto.* [redacted]

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*Pertamina is governed officially by a Board of Commissioners, which was established by law in 1971 to exercise broad policy and operational control over Pertamina, but past presidents of the company have exercised effective control. Besides designating the Minister of Mining and Energy as Chairman, the law also specified that the Minister of Finance and the Head of the National Economic Development Planning Agency (Bappenas) be members. Two other members may be appointed at the discretion of the President. In May 1983, President Soeharto named State Secretary Sudharmono and Minister of Research and Technology Habibie to the Board. Since his appointment, Sudharmono has made it clear that he speaks with the President's authority.* [redacted]

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- Contractors showed no interest in a number of blocks put up for bids by the government and paid only \$2 million in signature bonuses for contracts signed in 1983, down sharply from the \$32 million and \$111 million bonuses paid to the government during the boom years of 1981 and 1982 [redacted]

*Indonesia's oil contracts encourage long-term investment perspectives by assuring the oil companies of 20 to 30 years of operations if new discoveries prove commercial. In addition, they allow the operators full recovery of costs and a generous 15-percent share of output.* [redacted]

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**The View From Jakarta**

Jakarta ultimately is seeking to retain a larger share of oil earnings, advance Indonesian technological capabilities, and develop its resources on its own and has established a substantial bureaucracy to advance these goals (see box). Nonetheless, the government recognizes its dependence on foreign oil companies and has sought to maintain an attractive investment climate by providing financial incentives that would augment its stable political environment. As a result,

***The Indonesianization Push: Some Soft-pedaling.*** To encourage employment of Indonesians, government officials monitor oil companies' personnel practices and periodically impose new restrictions on hiring expatriates. In late 1982, the government published a list of drilling rig jobs that would be restricted to Indonesians by the end of January 1983. Jakarta

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backed down on the deadline after the foreign oil companies complained that there were not enough qualified Indonesians. The government has kept pressure on the oil companies, however, and is continuing efforts to phase out expatriates. [ ]

Although government pronouncements seem tough to many investors, the government allows oil companies to retain expatriates if the firms can demonstrate there are no qualified Indonesians and pay the government \$100 a month for each expatriate remaining beyond his expiration date. The funds are used to provide training for Indonesians. In other industries, firms must pay \$400 a month. [ ]

Jakarta continues to permit foreign participation in the oil service and supply sector while seeking to encourage Indonesian firms. One presidential directive requires that priority in government procurement—including purchases by the state-owned oil company, Pertamina—be given to indigenous firms. Another directive requires foreign investors to form joint ventures with Indonesian partners. The Indonesian share in these ventures, furthermore, must rise to 51 percent within 10 years. The Ministry of Mining and Energy maintains a list of approved oil industry suppliers and subcontractors, which includes only those firms that satisfy the government's criteria and prohibits oil companies from contracting with firms not on its approved list. [ ]

Jakarta's efforts to increase local participation in the oil industry include expanding the role of Pertamina. Besides its responsibility for all domestic refining and marketing, Pertamina produces about 100,000 b/d of crude oil, exports about 225,000 b/d of its own and contractors' crude, and oversees all production-sharing contractors. In 1983 the company stepped up its exploratory drilling to about 25 wells, initiated its first offshore operations, and expanded its production capacity by taking over former Stanvac concession areas. Pertamina's management authority also was considerably enhanced when it began to exercise decisionmaking authority over Caltex's operations. Furthermore, the expansions of the Cilacap refinery in Central Java and the Balikpapan refinery in East Kalimantan doubled the country's refining capacity to about 800,000 b/d, creating a temporary surplus and spurring Pertamina to seek export markets for products. [ ]

Although willing to compromise in areas where it depends on the foreign oil companies, Pertamina has also demonstrated its readiness to risk offending them on some issues. In determining the commercial potential of new discoveries, for example, Pertamina exhibits the more assertive management style introduced by Judo Sumbono (see box). Pertamina no longer simply accepts a foreign oil company's assessment of reserves, but makes its own reserve estimates and applies a stiffer criterion for determining the commercial prospects of a new discovery. Reserves must be large enough according to Pertamina's calculations to assure the government at least 51 percent of the recoverable crude oil after deducting the contractor's cost recovery and production share. Pertamina on several occasions has turned down requests for declarations of "commerciality" for new discoveries. Although there is no clear evidence that companies have declined specific exploration prospects because of Pertamina's tougher attitude, industry sources indicate that Pertamina's attitude has dampened exploration in frontier areas and has contributed to the focus on known producing areas. [ ]

**Hardline Approach to Caltex and Stanvac.**<sup>2</sup> Jakarta's moves to change contract terms at the expense of its contractors have concerned foreign oil companies. Negotiations last year for Caltex's new production-sharing terms and Pertamina's unilateral takeover of a large portion of Stanvac's former concession area, however, have had little apparent effect on investment decisions. The expiration of the concession-type contracts covering most of the area operated by Caltex and Stanvac, the country's last two concession operators, renewed suspicions that Jakarta might squeeze other oil companies for additional revenues, but Indonesian oil officials apparently convinced them Jakarta had no plans to revise their contract terms. [ ]

<sup>2</sup> The two US firms have been active in Indonesia since Dutch colonial times. Caltex, a Texas-based joint venture of Texaco and Standard Oil of California (Socal), operates worldwide and is Indonesia's largest crude oil producer. Stanvac, a joint venture of Mobil and Exxon, was formerly one of Indonesia's largest producers, but its output has stagnated at 30,000 to 40,000 b/d for many years while other producers have sharply boosted production. [ ]

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*The Kingpins in Energy Policy*

Subroto

Indonesia NSPR ©



Wijarso

Pertamina Bulletin ©

Energy policy making in Indonesia is largely in the hands of a small number of senior bureaucrats. Minister of Mining and Energy Subroto, one of President Soeharto's early technocrat economic advisers, has overall authority within the government for the conduct of energy policy. Foreign oil officials characterize him as a figurehead lacking substantive knowledge of the oil industry. Subordinate to him are three directors general, including Director General of Oil and Gas Wijarso, often described by oil industry officials as Indonesia's most knowledgeable and effective oil official. Both Subroto and Wijarso deal regularly with the foreign oil companies operating in Indonesia and represent Indonesia in such international forums as OPEC. [redacted]

Pertamina President Abdul Rachman Ramly manages the operations of the state oil company and oversees all the activities of the foreign oil companies. He replaced former Pertamina President Sumbono in June 1984. Sumbono was ousted after months of growing criticism from senior Indonesian officials, and foreign oil company representatives over his

inaccessibility, poor management, and financial misdeeds. His successor reportedly has close ties to Armed Forces Commander Murdani and has earned a good reputation for his management capability as head of the state tin corporation. Ramly's appointment should encourage the foreign oil companies, which have become increasingly critical of contract delays and operational difficulties caused by Sumbono, to continue to invest in Indonesia's oil industry.

Jakarta's calculated risk in taking over Stanvac's properties and demanding a larger portion of Caltex's output than the 85-percent share it receives under all other production sharing contracts has strengthened Pertamina's role in the oil industry. Besides gaining Soeharto's approval for the takeover of some two-thirds of Stanvac's production capacity over the objections of Wijarso, Sumbono took the lead in demanding a larger share of Caltex's output. The more cautious Subroto and Wijarso, in our view, probably played a mediating role by helping to modify Sumbono's position while convincing Caltex of the need for compromise. [redacted]

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In anticipation of an eventual changeover in its contract, Caltex in 1971 signed a production-sharing agreement to become effective in 1983. The contract included a 65/35 split in production in favor of the government, which was standard in 1971. After Jakarta revised all production-sharing contracts in 1976, Caltex officials recognized they would have to renegotiate terms in 1983, but hoped to obtain the new standard 85/15 production split. After protracted talks in 1983, the two sides finally agreed on an 88-percent share for the government, but negotiations dragged on for a month beyond the expiration date while Caltex sought some financial incentives for its enhanced recovery projects. The new contract terms assure a role for Caltex in the Indonesian oil industry beyond the end of the century. [redacted]

Jakarta took a much more uncompromising line with Stanvac, whose output of about 35,000 b/d represents only 5 percent of Caltex's production capacity. Unlike Caltex, Stanvac had not signed a prior agreement to replace its concession-type contract. Stanvac officials had hoped to sign a contract modeled on Caltex's new terms, but Pertamina officials notified Stanvac in April 1983 that the Indonesians would take over the concession area when the contract expired. [redacted]

Stanvac attempted to negotiate a compromise, but in November Pertamina took over a concession area that accounted for about two-thirds of Stanvac's output. Pertamina officials had complained that Stanvac had not developed its concession aggressively enough and, in our view, probably believe they can operate the Stanvac concession successfully. Furthermore, Pertamina President Sumbono probably faced less opposition within the government over the Stanvac takeover than over his hardline approach to Caltex, where the financial risk was much greater. [redacted]

#### **The Japanese Factor**

Tokyo's strategic interests are helping to maintain a high level of exploration in Indonesia and to some degree bolstering Jakarta's leverage with other foreign investors. Japanese firms in Indonesia benefit from the financial backing of their government, which enables them to take a long-term investment approach rather than react to short-term market fluctuations. Since 1979, Tokyo has furnished nearly \$250 million

in loans to finance exploration by Pertamina in partnership with Inoco (Indonesia Nippon Oil Company) and another \$110 million for the development of fields previously reserved for Pertamina. Pertamina is to repay the loans by supplying 40 percent of the output from the program within 10 years. If the program does not result in commercial production within 10 years, Pertamina is not obliged to repay the balance. [redacted]

Four Japanese firms—Inoco, Inpex, Japex, and Jambi Oil—are operating in Indonesia, either in partnership with other foreign firms or with Pertamina. Although technically independent, all four own shares of each other and all are partly owned by the Japan National Oil Company (JNOC). JNOC usually acts more as a holding company than an operating company, but reportedly is considering establishing its own operation in Indonesia. In our view, Tokyo considers all these firms key links in its efforts to assure secure oil imports, 15 percent of which come from Indonesia:

- In partnership with Union Oil and Total, Inpex (Indonesia Petroleum, Ltd) now has a 50-percent share in three of Indonesia's largest oilfields—Attaka, Handil, and Bekapai—and smaller shares of Huffco's Badak gasfield and the Nilam oil and gas field. Although not the principal operator of any of these fields, Inpex's share of output makes it the second-largest crude oil producer in Indonesia.
- Japex (Japan Petroleum Exploration Company) has been less successful in exploration in Lampung Province in southern Sumatra, but company officials remain interested in other areas in Indonesia. Japex remains engaged in a secondary recovery project at Pertamina's Rantau field in North Sumatra. It plans to spend \$85-125 million in a water-injection project and had already drilled 20 out of a planned 90 wells by late 1983. Water injection is scheduled to begin in late 1984 under a production-sharing contract.

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- Jambi Oil drilled a number of exploratory wells during 1981-83 that indicated the presence of hydrocarbons, but none has yet been declared commercial. Company officials reported spending \$10 million on exploration in 1983 and plan a similar amount in 1984. [ ]

The Japanese do not threaten the dominant role of US oil companies in the Indonesian oil industry, although they will probably exert increasing influence. Inpex, for example, signed a production-sharing contract in June 1982 for a 29,900-square-kilometer block offshore Banda Aceh, northern Sumatra, which could become one of the country's largest fields. The Indonesian Government, however, is already sensitive to the dominance of Japanese investment in nonoil sectors and would be concerned over the public reaction should Japanese firms attain a similar position in the oil industry. [ ]

#### Looking Ahead

Given the current soft oil market, we expect exploratory drilling to level off or decline slightly this year, although reductions in drilling costs during the current exploration slump will help to soften any downswing. Most companies probably will continue drilling in known producing areas or concentrate on development wells but will refrain from high-risk exploration in frontier areas. US and other foreign firms dependent on private financing are more likely than the Japanese firms to cut back drilling in response to market softness. In our view, Tokyo probably will encourage the Japanese firms to avoid sharp cutbacks. [ ]

#### A Potential Pitfall

We expect the government to continue pressing for an expanded Indonesian role in all phases of the energy sector, but not so vigorously that it would deter investment. Even so, Jakarta will have to restrain the hardline nationalism introduced by former Pertamina President Sumbono in asserting the company's interests against foreign oil firms. Indonesia's attractions—numerous oil-bearing basins, a stable political environment, and generous financial incentives—still outweigh its drawbacks for most foreign oil companies. A continuing tough line, however, could easily dampen enthusiasm for exploration in Indonesia, particularly if companies are prevented from recovering their costs by stiffer operating rules, such as the

current criteria for declaring fields commercial. The government will also have to refrain from significant changes in the standard production-sharing terms. Jakarta's economic planners are forecasting growth rates of 5 percent annually for the 1984-89 Five-Year Plan, down from the 7.6-percent average of the 1970s, based on a gradual recovery of oil exports. Any move by the government that would discourage oil company exploration would reduce the country's economic growth prospects below even these modest expectations. [ ]

Pertamina's dealings with Caltex could still discourage investment by Caltex and other foreign firms. Even under the most favorable circumstances, Pertamina's new management role will cause occasional frictions between Pertamina and Caltex. Although we do not foresee any drastic move by Caltex in the near future, excessive intervention by Pertamina in Caltex's operations could well dampen exploration. [ ]

#### The World Market: A Wild Card

Changing world oil market conditions are a more likely cause of fluctuating investment prospects in the Indonesian oil sector. A downward price spiral sparked by competitive price cutting among financially hard-pressed oil-producing countries would force the oil companies to cut spending plans worldwide. Although we would expect companies to continue producing crude oil in Indonesia, under these circumstances export earnings would fall, economic growth would slow, and we would expect a sharp drop in oil exploration. [ ]

Almost equally likely would be a disruption in world oil supplies of sufficient size and duration to spark substantial price increases. Should a closure of the Strait of Hormuz or stepped-up attacks on tankers in the Persian Gulf lead to a round of price increases, for example, Jakarta could enjoy a replay of the 1979-81 oil price boom. Oil companies would quickly boost output and step up exploration, further improving Indonesia's financial situation and growth prospects. Accelerated exploration would also restore the country's sustainable oil production capacity, which has fallen slightly in the past two years as depletion of reserves outstripped additions from new discoveries. [ ]

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## Appendix A

### The Push for Alternative Energy

#### Natural Gas on a Plateau

Jakarta's ambitious plans to develop alternative energy resources to conserve oil for export show mixed results, as Indonesia's finances have tightened and the government has cut back its investment spending plans. On the positive side, liquefied natural gas has reached a new plateau as four new trains (production lines) were added last year to the five existing trains at the country's two LNG plants, boosting capacity from 7.5 million tons of LNG a year to nearly 14 million tons. LNG continues to hold the strongest attraction for foreign investors because of profitable market opportunities in Japan under existing contracts. Earnings probably will rise nearly 50 percent to more than \$3.5 billion in 1985 if the purchasers take only the contracted amounts and will rise further if Jakarta can make additional spot market sales. Estimated reserves in the country's two producing gasfields—9 trillion cubic feet in the Badak field in East Kalimantan and 17 trillion cubic feet in the Arun gasfield in northern Sumatra—place Indonesia among the world's 10 leading sources of natural gas and assure sufficient supplies for expected growth in demand in the 1980s. Because of the high cost of LNG facilities, Jakarta has needed both the foreign producing companies and consumers to help in financing—over \$300 million each for the first five trains at Arun and Badak, and some \$500 million each for the four new trains, plus \$125-150 million for each of the seven original LNG carriers. [ ]

The soft market and the presence of commercial gasfields in neighboring countries are dampening prospects for further expansion of Indonesian LNG facilities. Jakarta has signed a contract to begin supplying 2 million tons of LNG a year to South Korea in late 1986 and is seeking additional sales to Taiwan and Kuwait. Earlier grandiose plans for further expansion of LNG exports have been scaled down as a result of Tokyo's downward revision of Japan's projected energy demand in the 1990s. Development of the giant Natuna gasfield in the South China Sea—with estimated reserves of 35 trillion cubic feet

of natural gas and 80-90 trillion cubic feet of carbon dioxide is delayed indefinitely because of poor market prospects. Pertamina agreed to 'stop the clock' on Exxon's contract, which called for relinquishing the field by 1990 if development were not under way. Even if Exxon were able to find a market for the natural gas, the company would still have to find an economical way to dispose of the large quantity of carbon dioxide. In addition, other firms have made gas discoveries in various parts of Indonesia, but have refrained from developing them because of poor market prospects. [ ]

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#### Coal and Other Resources—Longer Term Prospects

Indonesia's plentiful coal, hydro, and geothermal resources remain relatively untapped because the domestic market offers less lucrative sales prospects and development requires massive infusions of scarce financial, managerial, and technical resources. Rehabilitation of coal mines and expansion of electric power capacity have made very limited progress. Jakarta has made a start in reviving coal output from the traditional coal mining areas of South and West Sumatra to fuel new power plants, but financial stringency and bureaucratic ineptitude have already pushed development two years behind schedule. [ ]

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The state coal company, P. T. Tambang Batubara, with financial and technical assistance from the World Bank and other aid donors, is undertaking the rehabilitation of the coal regions in Sumatra where mines have been operating for more than half a century. Plans call for Jakarta to finance half the \$1.2 billion cost of the expansion of the southern Sumatra mining region. In East and South Kalimantan, where reserves have not been delineated, Jakarta has turned to the private sector and signed seven production-sharing contracts with foreign mining companies to explore over 50,000 square kilometers, as shown in table 3. [ ]

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**Table 3**  
**Indonesia: Coal Production Sharing Contracts**

Company (Country)	Block	Area (hectares)	Comments
P. T. Arutmin	South Kalimantan	1,260,000	Joint venture: Arco/Utah Exploration
P. T. Utah Indonesia	East Kalimantan	797,200	Utah Mining
AGIP (Italy) Consolidation Coal (United States)	East Kalimantan	774,200	Joint venture
P. T. Kaltim Prima	East Kalimantan	790,000	Joint venture: Conzinc Rio Tinto (Australia) and BP (United Kingdom)
P. T. Kideco Jaya (South Korea)	South Kalimantan	255,000	
P. T. Adara Indonesia (Spain)	South Kalimantan	150,000	
P. T. Berau Coal (United States and Japan)	East Kalimantan	497,625	Joint venture: Mobil (United States) and Nissho Iwai (Japan)

Jakarta is assured a minimum level of spending by foreign mining companies in Kalimantan for several years because the production-sharing contracts specify that the companies must spend \$120 per square kilometer for general surveys and \$500 per square kilometer for exploration. Nonetheless, development of coal resources offers little promise before 1990. The timetables and spending commitments allow nearly a decade of preliminary work and the companies are just beginning. Furthermore, given the soft market for oil and other energy resources and the cost of coal development, companies will postpone decisions on actual mining operations as long as possible. Compounding the problem will be Jakarta's probable continuing financial stringency in the 1980s, which will impede development of transportation and other infrastructure. [ ]

The Indonesians are moving ahead on developing nonexportable resources such as geothermal and hydroelectric power to conserve crude oil for export, but progress is slow. Jakarta is turning to foreign investors to develop geothermal projects and is relying on the World Bank and other aid donors for assistance in expanding hydroelectric capacity. The Indonesians are concentrating on Java, where the demand for electricity is greatest. [ ]

Control of geothermal development is split between Pertamina, which is responsible for the wells and

steam collection system, and PLN, which is responsible for the electric power generation and distribution facilities. Pertamina is planning to develop some areas, such as the Dieng Plateau in Central Java, by itself. It also is planning to expand a 30-megawatt plant at Kamojang, West Java, with assistance from New Zealand, which helped build the existing plant. Pertamina has signed a contract with Union Oil for a geothermal plant in West Java and is in advanced negotiations with a Caltex subsidiary, Amoseas, for another. The Indonesians are moving ahead slowly on several hydropower projects—typically multipurpose projects with long leadtimes—with major financial and technical assistance from the World Bank. The current Five-Year Plan calls for hydroelectric capacity to expand from about 1,300 MW in 1983 to 1,740 MW by 1988. [ ]

Even if oil prices rose sharply, investment in alternate energy resources probably would continue to lag because of the difficulties in marshaling the necessary managerial, technical, and financial resources. Furthermore, given the abruptness of the last recession and the high likelihood of a similar sudden downturn, Jakarta probably would be reluctant to renew a full-scale development program, but would gradually step up construction. [ ]

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